

***In situ* Characterization of Organic Electronics**

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Solution-processed organic electronics have attracted considerable attention due to their high performance, low cost and easy manufacture. Achieving high performance requires that the microstructure and morphology of solution-cast thin films – that develops via nucleation and growth processes – exhibit a high degree of crystallinity with two-dimensional in-plane π -stacking, a low density of grain/domain boundaries exhibiting low crystallographic misorientation. Efforts to tune the microstructures and morphologies of solution-cast thin films require the more controllable casting processing and the more accessible *in situ* characterization methodology.

I will present the efforts in CHESS to develop *in situ* x-ray scattering techniques for structural characterization. Multiple casting techniques including conventional casting methods in lab, such like drop-casting and spin-coating, and roll-2-roll processing, have been explored. The results reveal the relationship between the microstructure, morphology and the device performance and direct fine tuning of the casting processing for advanced organic electronic devices.